

# ITALIAN JOURNAL OF FOOD SCIENCE

*Rivista italiana  
di scienza degli alimenti*



Volume XXI  
Number 4  
2009

# CROSS-NATIONAL SEGMENTATION FOR MESSAGING ABOUT CHEESE: TOWARDS A NEW APPROACH TO CONSUMER UNDERSTANDING, DIRECTED DEVELOPMENT, AND TARGETED MARKETING

CROSS-SEGMENTAZIONE NAZIONALE PER LA MESSAGGISTICA  
SUL FORMAGGIO: VERSO UN NUOVO APPROCCIO  
ALLA COMPrensIONE DEL CONSUMATORE,  
ALLO SVILUPPO DIRETTO E AL MARKETING MIRATO

**G. GABAY<sup>1</sup>, K. PAULUS<sup>2</sup>, P. AARTS<sup>3</sup>, J. BECKLEY<sup>4</sup>,  
H. ASHMAN<sup>4</sup>, and H.R. MOSKOWITZ<sup>5\*</sup>**

<sup>1</sup>College of Management Academic Studies, School of Behavioral Studies,  
Rishon Letzion, Israel

<sup>2</sup>ProGes Food GmbH, Ringstr. 1, D - 55245 Waldalgesheim, Germany

<sup>3</sup>1A, Route de Marche, 5377 Somme-Leuze, Belgium

<sup>4</sup>The Insight & Understanding Group, Denville, New Jersey, USA

<sup>5</sup>Moskowitz Jacobs Inc., 1025 Westchester Ave., 4th fl., White Plains, NY 10604, USA

\*Corresponding author: Tel. 914-421-7400, Fax 914-428-8364,  
e-mail: mjihrm@sprynet.com

## ABSTRACT

Questions regarding the existence of one appropriate message across global markets for the same cheese

## RIASSUNTO

Fino ad oggi, le questioni riguardanti l'esistenza di un messaggio appropriato in tutti i mercati mondiali per lo stesso

- Key words: cheese, conjoint analysis, consumer mindset, cross-nation segmentation -

do not seem to have been explored. Three parallel, linked conjoint analysis studies were conducted in Germany, France and the United Kingdom to identify which features and communications about cheese products drive consumer interest. In each study, consumers evaluated 60 unique concepts comprising 2-4 elements dealing with 'types of cheese, emotional benefits, and country of export, respectively. The elements varied in the degree to which they drove interest. Three mind-set segments emerged when the respondents were segmented by the pattern of their individual utility values, independent of country. The segmentation transcended countries and conventional classification groups, such as gender and age. Segment 1 comprised individuals responsive to flavour messages about *cheese with something* (46%), segment 2 comprised individuals responsive to flavour messages about cheese, i.e., *cheese as the focus* (32%), and segment 3 comprised individuals responsive to experiential messages about the occasions when cheese is served, i.e., the *cheese experience* (22%). Since these segments transcend conventional demographics, to find these segments in the population requires an intervention method, i.e., a 'consumer interactive typing tool'. This study revealed that a 3-phrase questionnaire could correctly classify about 2/3 of the respondents into the appropriate segments. The results are discussed in terms of how knowing these segments can guide product developers and marketers through the creation of inbound 'micro-sites' for development and outbound 'targeted selling messages' for sales.

so tipo di formaggio non sembrano essere state esplorate. Tre paralleli e fra loro collegati studi di analisi congiunta sono stati condotti in Germania, Francia e Regno Unito, per identificare quali caratteristiche e comunicazioni sui prodotti caseari determinano gli interessi dei consumatori. In ciascuno studio, i consumatori hanno valutato 60 concetti unici comprendenti da 2 a 4 elementi riguardanti rispettivamente i tipi di formaggi e benefici emozionali e il paese di esportazione. Gli elementi variano dell'interesse sollevato. Tre segmenti di atteggiamento mentale sono emersi quando gli intervistati sono stati segmentati in base al modello dei loro valori di utilità individuale, indipendente dal paese. La segmentazione trascende dai paesi e dai gruppi di classificazione convenzionale, come sesso ed età. Il segmento 1 comprende risposte individuali sui messaggi del gusto come *formaggio con qualcosa* (46%), il segmento 2 comprende risposte individuali sui messaggi del gusto come formaggio per se (32%) e il segmento 3 comprende risposte individuali su messaggi empirici circa i momenti di consumo del formaggio, es. *l'esperienza del formaggio* (22%). Poiché questi segmenti trascendono le demografie convenzionali, per trovare questi segmenti nella popolazione è richiesto un metodo di intervento come, ad esempio, "uno strumento interattivo per i consumatori". Questo studio rivela che un questionario con tre frasi potrebbe correttamente classificare circa 2/3 degli intervistati dentro il segmento appropriato. I risultati sono discussi in termini di come questi segmenti possano guidare i progettisti e venditori dei prodotti attraverso la creazione di un "micro-sito" in arrivo per lo sviluppo e uno in partenza "messaggi di vendita mirato" per i venditori.

## INTRODUCTION

Firms use branding as a key strategy to attract new consumers and to retain current consumers with original brands, thereby improving the firms' market share (ARNADE *et al.*, 2009). Consumers' brand loyalty and desire for brand varieties play an important role in the demand for cheese products and the profitability of firms which market foods. The study of TREVISIOL (2005) for the European Dairy Industry Model forecasted an optimistic growth rate for the consumption of cheese. According to these estimates the consumption of cheese will increase in each country in Europe. Furthermore, the consumption of cheese and processed cheese in countries from the European Union-11 will increase by the highest annual average.

Since country borders have a porous nature, manufacturers of packaged goods need to develop a strategy beyond branding in order to maintain the attractiveness of those brands that are exported from a region of strong brand development to another region where the brand is unknown (BONETTI, 2004). One such strategy is *messaging* (KOTLER, 1997). Messaging is defined as marketing-derived 'words and phrases' that a company uses to describe a product to a consumer, in order to convince the consumer to buy it and to consume it. Messaging carries with it a tonality beyond description. It is description motivated by the desire to convince consumers in a positive way, either about the product itself, the brand, or the experience surrounding the product. Messaging precedes both brand and product (NEDRIECH and SWAIN, 2008).

From the standpoint of business economics, the number of foreign and domestic competitors has increased enormously (BONETTI, 2004), requiring that a company become increasingly customer-focused in order to maintain a competitive edge. Consumers represent the ul-

timate but yet the most important component within the food chain. The study of consumers helps firms and organizations to improve their marketing strategies by understanding consumers' attitudes and shopping behavior. With this knowledge, marketers adapt and improve their marketing messaging strategies in order to reach the consumers' needs in the most appropriate way.

It is important to keep in mind that when one works with consumers, simple descriptions of products, their benefits, and the experiences with those products, do not necessarily suffice to motivate purchase. And, in the creation of a product, simple descriptions alone do not necessarily capture the unique features of products to which the consumer is attuned, and which the developer must capture in the prototype to be created. The messaging adds that bit of individuality and flair to the product, which in turn guides the developer, helping to identify specific 'extras' to be incorporated into the product.

Various cheese studies have investigated responses to both products and to messages regarding specific tastes, texture, and emotional experiences connected with cheese. For example, LIGGETT, DRAKE and DELWICHE (2005) reported that in Switzerland consumer acceptance of commercial Swiss cheeses is a function of their flavor characteristics. PATTISSON and LINDGREEN (2004) reported that the best development potential for the dairy industry in southwest England is mature cheddar, specialty cheeses, suitable territorial cheese varieties and other fresh cheeses.

Cheeses are also subject to economic factors, and to evolving economic conditions. For instance, in the Slovakian dairy industry, in the past production focused on cheap bulk commodities. Nowadays increasingly sophisticated consumers and more competitive markets push companies to segment their offerings (KAPSDORFERO-

VA and NAGYOVA, 2007). These within-country segmentations have been the topic of a number of research projects. In Norway, WESTAD, HERSLETH and LEA (2005) segmented consumers based on their cheese preferences. MURPHY *et al.* (2004) segmented consumers in Ireland based on preferences for a strong flavor, a hard texture, a wax packaged wheel, made with pasteurized milk, nutritional information present on the package, a white colored cheese and a price. They reported two segments with different ideal product profiles. Finally, BOGUE and RITSON (2005) identified the extrinsic and intrinsic attributes which determined end-users' preferences for a range of full-fat and lighter dairy products in the United Kingdom. They identified clusters of end-users with similar preferences for both the full-fat and for the lighter dairy products.

With the increasing globalization of the business world, cognition, responses to messaging, and thus international messaging segmentation is evolving into an evermore important strategy for marketing (STEENKAMP and HOFSTEDE, 2002). Messaging can also play a role in product development. By knowing what consumers want, and by identifying unmet needs, product developers can better focus their efforts. The key then is to better discover the *specific messages*, a task that can become difficult when a product is to be developed for, or sold in several countries, having different cultures, different food habits, and different arrays of products against which the new product must compete.

There is a body of information about messaging regarding cheese, but not to the level of specificity which exists for response to actual products. Studies regarding the cheese country of origin (LUOMALA, 2007) showed that consumers attach meaning to foods of various origins. Finnish consumers associate partly overlapping, partly, distinct cognitive, affective and normative

meanings with Swedish, German and French foods.

To date, questions regarding the existence of one appropriate message across global markets for the same cheese do not seem to have been explored. Does each market require its own messaging to interest consumers in that country? Does the same message perform differently in different countries, and if so then how can the marketer customize the message? These are questions which move beyond product to marketing, but depend vitally on the sensory characteristics of the product. People buy foods for sensory pleasure as well as for health and nutrition, so an understanding of what messaging works for foods may help the product find acceptance in new markets. In some cases, the messaging may also show what has to be changed in the product to appeal to the new consumer.

A typical consumer may see several thousand messages about products and services in a single day (SCHULTZ *et al.*, 1993). In light of the ongoing, ever-increasing bombardment of consumers by information, a key business objective is to identify the specific messaging which can break through, and then which can enhance product acceptance. Communication of food messaging demands knowing what to say about the product, what not to say, how to say it, and to whom one should communicate. The style of message, the content, and even the time of message, may all influence a consumer's receptivity (KOTLER, 1997). Consumers are continually confronted with communications about products and services. How do we know what particular elements reinforce a message regarding a specific food, and how can the marketer and the company use that information to sell their products more effectively?

Conventional methods to collect data regarding food, such as in depth interviews, or focus groups, typically consider a reduced set of test messages. Such

research settings are artificial versus an external world where multiple factors may affect consumer choice and subsequent consumption. Matters become even more difficult when the data collection process is long, expensive, and implemented in a global environment characterized by different, market-specific issues hampering research execution.

To cope with these issues researchers have developed other methods in order to understand the mind of the consumer. One of these, featured in this paper, uses experimental design of messages executed through web-based conjoint analysis. Conjoint analysis, a branch of experimental design with a long, 45+ year history (LUCE and TUKEY, 1964), and thousands of published papers, uses systematically varied test stimuli (concepts), comprising different messages, much as one might work with small test advertisements. In the conjoint experiment the researcher exposes respondents to an array of interacting elements, i.e., the test concepts. Consumers respond to the compound communication, in a way similar to what they might respond to in the external world. The components or elements of these mixtures must compete with each other to drive the consumer response to the test concept. By mixing and matching these messages in many different combinations and deducing what drives the response through *post-hoc* regression modelling, the researcher identifies that part-worth contribution of each element. For the food industry, conjoint analysis in particular, but experimental design in general, identifies the important elements. Conjoint analysis increases the scope of the message research, revealing 'what works, for whom, and where'. Furthermore, conjoint analysis provides the 'raw material' for segmentation based upon patterns of responses to actual test communications, rather than relying on questionnaire methods where the respond-

ent can give 'politically correct answers' (GREEN and KRIEGER, 1991).

When applied to mixtures of communications rather than to single communication points, experimental design has been extraordinarily popular among both academics and business professionals, and for both theory of consumer behaviour as well as specific tactical issues for the business venture (WITTINK *et al.*, 1994). The foundational work using conjoint analysis, published 45 years ago, originally designed to identify how consumers 'trade off' features of products, was quickly applied to marketing issues (GIL and SANCHEZ, 1997; LUCE and TUKEY, 1964; GREEN and SRINIVASAN, 1980). Conjoint analysis reveals how consumers in markets respond to the array of actual messaging currently in the market (MOSKOWITZ *et al.*, 2003; MOSKOWITZ *et al.*, 2002). More recently, conjoint analysis has been used to identify what emotions and product features drive acceptance (MOSKOWITZ and GOFMAN, 2007). Finally, focus in the academic community is now recognizing the importance of individual-level modelling (e.g., GREEN and KRIEGER, 1996).

This paper presents country-level information, gathered by aggregating individual level models. Thus, experimental design of messaging may help the researcher, product developer, and marketer in a company to identify the specific messaging for a product, both within a country, and across countries. In the process of design and analysis, we developed three specific hypotheses to guide the design, the empirical data acquisition, and the analysis:

Hypothesis 1: There are distinct segments of cheese consumers. Some segments are based on product features and others on the experience of cheese.

Hypothesis 2: Segments transcend countries.

Hypothesis 3: Segments are based on responses to test stimuli rather than on people's self-explicated attitudes, necessitating a different type of discovery mechanism.

This study uses experimental design, focusing on responses to concepts about cheese in three countries, and makes four contributions to data basing and global segmentation.

1. It shows how to create a database across countries for a single product, in order to understand the mind of the consumer in each country with respect to the same food product, cheese.

2. In contrast to traditional 'one-stimulus-at-a-time' methods used to identify powerful messaging, the research details a more advanced approach using experimental design of mixtures. Experimental design allows the more impactful elements to emerge, even if the respondent cannot articulate what is important.

3. The study extends previous methods for looking at common segmentation across countries, as part of an initial attempt to create general, 'world-rules' for specific products (STEENKAMP and HOFSTEDE, 2002).

4. The study shows how to assign new respondents to one of the three mind-set segments for cheese, based upon a short 'intervention', i.e., a typing questionnaire, lasting no more than one minute. The typing tool provides the opportunity to classify new individuals, making it possible to create micro-sites appropriate for each mind-set segment, with these micro-sites either devoted to product design using in-bound interactions with consumers, or devoted to product messaging using out-bound communications designed by marketers.

## MATERIALS AND METHODS

The original database from which these results are drawn comprised 20 studies per country dealing with response to foods (AARTS *et al.*, 2002). The studies were all of the same type – conjoint analysis of messaging for a particular product, followed by an extensive classification study. One study per product category was conducted in each of three countries: France, Germany, and the United Kingdom. The database from the 20 studies provides a large-scale cross-section of responses to messages for a variety of common foods, such as colas, pizza, etc. Each country had its own set of 20 studies. When a product was assessed across each of the three countries, the elements and the classification questionnaire were the same (MOSKOWITZ *et al.*, 2005). The approach to consumer understanding using multiple, linked studies using conjoint analysis is relatively new, having begun in 2001, with the availability of easy-to-execute, self-authored conjoint analysis on the internet (FOLEY *et al.*, 2009; MOSKOWITZ *et al.*, 2001; MOSKOWITZ *et al.*, 2005a).

The elements for each conjoint study were organized into silos and elements, for a total of 36 elements. The silos and elements were created by a multi-country task force which designed the studies for three countries (France, Germany, United Kingdom) based upon previous studies of the same type conducted in the United States (BECKLEY and MOSKOWITZ, 2002). The elements were chosen in order to reveal how consumers in the different countries would react to different types of messaging, what type of country-to-country variations existed, whether the respondents reacted in a manner similar to emotional elements, and whether there existed a segmentation that transcended one country. The existence of such transnational segmentation simplifies mul-

ti-national product development and innovation.

The basic experimental design comprised four silos or buckets of elements, with nine elements per silo. Each silo comprised elements that were similar in qualitative nature. Silo 1 (elements 1-9) comprised phrases describing the type of cheese. Silo 2 (elements 10-18) comprised phrases dealing with uses and benefits of cheese, silo 3 (elements 19-27) comprised elements that promised emotional rewards; and finally, silo 4 (elements 28-36) comprised elements dealing with the cheese country of export. The division of elements into silos was done as a bookkeeping device to ensure that a concept would not contain two elements that could contradict each other. In the analytical phase all elements were treated as independent variables, so that the different silos are only relevant as control devices for the creation of the test concept. Across the three countries, 34 of the 36 elements were identical. Only two of the elements, corresponding to country of origin, differed across the three studies.

The 60 test concepts per respondent were developed by experimental design. Each respondent evaluated a unique set of combinations. The test concepts were short, easy to understand descriptions of a cheese product. A single concept comprised 2-4 concept elements, one or no element from each of the four silos. Each concept element appeared three times against different backgrounds among the 60 combinations evaluated by the respondent.

The experimental design was a main effects design, so that each of the 36 elements was statistically independent of every other element. This independence was achieved by having some silos entirely absent from a concept. Such independence has the statistical property of allowing an estimation of absolute level of utility, not just relative level as is typically the case when concepts are

designed to comprise one element from each of the silos (BOX *et al.*, 1978). Furthermore, the unique set of 60 combinations was created for each respondent based upon a permutation scheme that used the basic design, but renumbered the elements. Thus each respondent evaluated a unique set of combinations. This scheme (MOSKOWITZ and GOFMAN, 2004) ensured that no bias could occur due to a specific pair of elements appearing unduly frequently with each other, a problem that plagues conventional conjoint studies using one basic set of test stimuli evaluated by many respondents.

The respondent was invited to participate in the survey by an e-mail invitation, which offered a sweepstakes reward, so that there was an incentive to participate. Respondents received their invitations from a local provider, specific to the country. The e-mail link simply specified that the respondents were being invited to a study of food and drink, but gave no more information. All three countries had reasonably well-developed internet penetration, so finding respondents was no problem. One internet panel provider in each country, specializing in such field work, was selected to provide the panel. There was an approximately 2 to 4% response from the different countries, slightly lower than the US response rate of about 6% for that same time frame.

Respondents who received the email invitation and clicked on the link were then guided to a 'wall'. The wall presented the available research studies, of which there were 20 per country. Each respondent who chose to participate was instructed to click on the study, which most interested him, at which point the study began. This strategy increases the probability that a respondent participates in a study that is personally relevant. After a study quota (>125 respondents) was already filled the study 'disappeared from the wall' and was automati-

cally suspended until reactivated by the researcher. This strategy ensured adequate numbers of respondents for each study. Each study began with a short introduction about the project. The introduction, one screen long, told the respondent that the study was about the degree to which respondents 'craved' or 'liked' a product very much. The introductory screen then gave the respondent a brief description of the scale and described the sweepstakes. Nothing else was mentioned. The study then moved to the test concepts.

The respondent completed the basic interview comprising 60 screens which presented the test concepts for cheese. The test concepts were created according to a basic experimental design, which was permuted. Every respondent evaluated each concept element three times in the set of 60 combinations, testing concepts that comprised 2-4 elements. The nature of the experimental design dictated that some concepts would be absent from a particular silo. After evaluating the 60 concepts, the respondent completed a short classification questionnaire which instructed the respondent to indicate gender, age, region where he/she lived, reasons for buying cheese, the specific times when cheese was desired, as well as self-rated hunger. Finally, at the end of the interview the respondent logged out of the study.

The respondent could not change the rating to any concept, once the rating had been assigned. As soon as a rating was typed it was sent to the server. The respondent could, however, change the self-profiling classification question before submitting the answer. The interview lasted 12-16 minutes, depending upon the speed of the respondent. This period falls within the range that has been shown to generate a pleasant respondent experience with an Internet-based interview, and is considered an appropriate time for best practices in internet-based interviews (MAC ELROY, 2000).

## RESULTS

The panel for the cheese study comprised 328 individuals, with more participants from France and fewer from the United Kingdom (Table 1). All three countries began with the same number of e-mail invitations sent out to prospective respondents at the start of the project. The United Kingdom required an additional email invitation to new respondents to boost the sample.

### Identifying drivers of concept acceptance through modelling

The ratings for each respondent were incorporated into a respondent-level model relating the presence/absence of the 36 concept elements to the ratings. Since the elements were systematically varied by experimental design, standard regression methods can be used to create the models. The simplest method generating the most understandable results is ordinary least-squares, using 'dummy variable' predictors. In the regression analysis, each of the 36 predictors,

Table 1 - Distribution of respondents across classification questions dealing with gender, age, and self-reported hunger level. Numbers in the body of the table are actual numbers of respondents in each classification group.

	France	Germany	United Kingdom	Total
<b>Gender</b>				
<b>Female</b>	63	67	65	195
<b>Male</b>	80	36	17	133
<b>Age (Upper)</b>				
<b>18</b>	16	7	2	25
<b>25</b>	43	33	11	87
<b>35</b>	33	53	42	128
<b>45</b>	33	4	12	49
<b>55</b>	14	3	11	28
<b>65</b>	4	3	4	11
<b>Total</b>	<b>143</b>	<b>103</b>	<b>82</b>	<b>328</b>

or independent variables, take on the value 0 if the element is absent from the concept and 1 if the element is present in the concept. This binary nature rather than metric nature of the independent variables is the reason for the name 'dummy variable'. Each respondent generates 60 such observations or cases in regression terminology, with each case comprising 2-4 concept elements, depending upon the specific combination called for by the design.

Two models were created, both using ordinary least squares regression, using an individual level model, and so-called dummy variables (SYSTAT, 2002). The only difference between the models was the specific dependent variable.

#### The persuasion model

Here the dependent variable was the actual 9-point rating assigned to the combination. The persuasion model can be written as:  $\text{Rating} = k_0 + k_1(\text{Element } 1) \dots k_{36}(\text{Element } 36)$ .

#### The interest model

This model is developed after the ratings are converted to a binary scale, using criteria chosen by the consumer researcher to define the cut-point on the rating scale. For example, many consumer researchers working a five-point purchase scale choose the top two ratings on which to focus. For a 9-point scale the authors have typically focused on the top three ratings (ratings of 7-9) to represent acceptance of the particular concept being evaluated. This focus on membership in a group (concept acceptors; ratings 7-9) follows the convention in consumer research, which studies membership in a group, i.e., accept a concept, thus being a concept acceptor, rather than studying intensity of feeling. Intensity of feeling, rather than membership in a group, is left as a topic to research psychologists.

The interest model is also written as:  $\text{Binary Rating} = k_0 + k_1(\text{Element } 1) \dots$

$k_{36}(\text{Element } 36)$ . The dependent variable, i.e., the binary rating, is now either a 0 for any particular concept or a 100 for the concept, depending upon the original rating assigned by the respondent for that concept, using the 9-point scale. Ordinary least squares regression estimates the 36 coefficients and the additive constant, again at the level of the individual respondent.

For both regression models a very small random number (magnitude < 0.0001) is added to all of a respondent's ratings to ensure that the regression analysis would work. This statistical modification of the rating is prophylactic, ensuring no regression failures. The statistical correction has no perceptible impact on the parameters emerging from the regression modelling.

Although the original assignment of the elements to concepts was done within the framework of the silos, the regression analysis takes no account of the silos when estimating the model, nor does it need to do so. The experimental design makes the silo irrelevant for statistical analysis. The silos would be relevant when the design requires one element from each silo had to be present in the concept. By moving away from this so-called effects model (one element from each silo present) to true zero conditions for silos (a silo may be entirely absent), we avoid the problem faced by traditional research. Certainly smaller concepts with some silos missing may generate incomplete concepts. Yet, the incompleteness is outweighed by the benefits. The stratagem produces databases whose utilities have ratio scale properties, and can be compared across studies with different elements, done at different times. Thus the current approach produces data that can be used as the foundation for a science, rather than simply relative numbers that have meaning only within the limited world of the single study.

All discussion of modelling derives from the interest model, except for

the specific steps used in the development of segments. Analyses of variance were done for individual-level modelling, as well as for the large database which combined the data from all respondents within a single country. Estimates of significance with the full model suggest that coefficient differences for the interest model greater than 5 are highly significant ( $p < 0.01$ ). The precise cut-off value for statistical significance at the 95 and 99% confidence levels vary by element, however. A good and quite conservative rule of thumb considers differences of 6 or more to be statistically significant across all elements.

#### How the elements perform

The results from the modelling appear in Table 2. Each respondent generates an individual model. The table shows the average coefficient across respondents for each of the 36 elements, for each of the three countries. The model comprises two parts; the additive constant and the 36 terms. The additive constant for the interest model shows the conditional probability of a person being interested in cheese, in the absence of any particular communication element. The additive constant is an estimated value, based upon the pattern of ratings assigned by an individual to the 60 concepts. At a more interpretive level, the additive constant may be considered a baseline for acceptance of cheese. It is important to note that for the data in Table 2, the utility values are shown by country.

The individual utility for an element is the conditional probability or odds that a person will switch the rating from not interested (rating 1-6) to interested (rating 7-9) if the element were to be introduced into the concept. The statistical meaning of the individual utility is the coefficient for the element for the particular individual.

Do respondents in the three countries show the same pattern of interest in cheese?

The additive constant suggests that basic interest in cheese varies across countries. The constant has the lowest value for Germany (19, i.e. 19% of the respondents would give a rating of 7-9 for a cheese concept without any elements), an intermediate yet still low value of 31 for the United Kingdom (i.e. 31% of the respondents would give a rating of 7-9 for a cheese concept), and a high of 45 (i.e. 45% of the respondents would give a rating of 7-9 for a cheese concept) for France. For comparison purposes, a product such as pizza evaluated in the same type of study generated additive constants of 35 for the United Kingdom, 29 for Germany and 39 for France, respectively. The additive constant combines both a response bias (magnitude of the numbers used in a country) with actual country-to-country differences in the basic acceptance of a product idea.

The elements also differ in their impact. Table 2 shows a fairly wide range of these utilities in each country. For example, in the United Kingdom, the element "*Cheddar with a typical strong flavour*" generates a utility of +20, "*Cheese with a glass of wine or a soft drink of your choice*" generates a utility of +10, and finally "*Soft light cream coloured Brie - perfect with crusty bread*" generates a utility of +12. This means that when these elements are introduced into the concept an additional 20, 10 and 12% respectively of the respondents change their rating from 1-6, going up to 7-9, i.e., changing from indifferent/disinterested to interested.

There are clear country-to-country and within-country differences across the common elements. Yet, no simple pattern emerges to reveal why some concept elements perform well and others perform poorly. It would be incorrect to

conclude that concept elements dealing with the description of the product tend to perform well, whereas emotional benefits, as part of concepts, tend to perform poorly. However, 'puffery' emotional statements tend to perform poorly. Thus, elements such as "*Cheers you up*" and "*Celebrate special occasions with cheese - escape from the routine*" perform poorly across all three countries. Country of cheese export also generally perform poorly, except in some instances such as France, which does slightly better in Germany (utility +6) than it does in France (+4) and is irrelevant in the United Kingdom (-1).

Do trans-national segments exist for cheese?

Individual differences in preference functions for actual products can be seen by visiting any supermarket (MOSKOWITZ *et al.*, 1985). These preference differences are profound, existing even at the level of 'model systems' of water and a simple tastant such as sugar or salt (EKMAN and AKESSON, 1964; PANGBORN, 1970).

One key benefit of running a multi-country study with the same elements is the ability to identify groups of like-minded respondents based upon their responses to the concept elements. The search for these segments focused on the 36 elements. The segmentation method has already been described in detail (MOSKOWITZ *et al.*, 2005b).

Segmentation follows the steps enumerated below. It is important to note that the segmentation does not begin with any preconceived notion either about the number of segments or the names of the segments. Rather, the segmentation partitions the respondents into groups such that the variability within a group or the respondent-to-respondent distance is small, whereas the variability across group or the group-to-group distance is large.

Step 1: Use the persuasion model at the individual respondent level to define the utilities for the 328 respondents, independent of country. This first step requires that the persuasion model be run at the individual respondent level, which is straightforward since the design created combinations appropriate for individual-level modelling. The persuasion model provides metric information about the degree of interest generated by a specific element.

Step 2: There may be redundancies in the utility values across the respondents for elements, i.e., specific elements on which the clustering will be performed. Remove the redundancy, and then perform a principal components analysis of the utilities on the identical elements across the 328 respondents, independent of country. This generated 11 factors, extracted by principal component factor analysis, whose solution can be rotated to a simple solution by quartimax rotation. Table 3 shows the strongest loading element(s) on each dimension or factor, defined as a correlation > 0.6 with the dimension.

Step 3: Each respondent corresponds to a single point in this 11-dimension factor space. The respondent is identified as a point having 11 values, one per dimension. Cluster the respondents based on their 11-dimensional factor scores, using k-means clustering. The measure of distance between respondents is defined as the geometric or Euclidean distance between the two respondents computed on their corresponding 11-dimensional factor scores. Table 4 presents the sum of squares within factors, the sum of squares between factors, and the F ratios. It is clear from the order in the table that those factors emerging from the principal components factor analysis and explaining most of the variability in the attribute ratings are not necessarily the same as

Table 2 - Average utility values for cheese type, cheese use benefits, cheese emotional benefits, and country of spending coefficients from the individual models. The utilities come from the 'interest' model, so the numbers in the concept. Strong interest drivers (utility or coefficient > 10) are shown in bold. The coefficients are sorted right of every utility. (Note: Elements whose meaning differ across the three countries are shown at the bottom

France	MN	SE	Germany
Constant	45		Constant
<b>SILO A: Types of Cheese</b>			
A2 Du fromage bien fait à la coupe	8	2.3	Stuecke von gereiftem Kaese
A9 Un Brie fait à coeur, avec un morceau de pain frais et croustillant	<b>20</b>	3.3	Cremiger, hellgelber Brie, der auf dem Brot fast verlaeuft
A4 Du fromage doux et crémeux	1	2.8	Cremiger Weichkaese
A7 Un bleu traditionnel avec son arôme intense	<b>11</b>	3.8	Blauschimmelkaese mit typischem und intensivem Geschmack
A5 Des cubes de Feta pour une salade Grecque ou avec des légumes	-7	2.6	Brocken von Fetakaese fuer einen griechischen Salat oder mit Gemuese
A3 Du fromage à tartiner	-18	2.1	Streichfertiger Kaese
A1 Du fromage en tranches	-14	3.5	Kaesescheiben
<b>SILO B: Use Benefits of Cheese</b>			
B2 Avec un verre de vin rouge	5	3.4	Mit dem passenden Getraenk, z.B. Rotwein
B9 Si bon qu'on en savoure chaque bouchée	2	1.8	Jeder Biss so schmackhaft, dass man mit der Zunge ueber die Lippen faehrt
B5 Y penser, c'est déjà savourer!	1	2.1	Schon bei dem Gedanken daran laeuft einem das Wasser im Mund zusammen!
B6 100% naturel, frais et affiné avec soin	6	2.3	Natuerlich, frisch und schonend hergestellt
B8 Le voir c'est le désirer!	3	1.9	Beim Betreten des Geschaeftes ist der Geschmack schon zu empfinden
B4 Excellente qualité, ce grand classique du goût comme autrefois	2	3.5	Topqualitaet mit absolut typischem Geschmack
B3 Avec du pain et du raisin	2	3.5	Mit Weissbrot und Trauben
B1 Pas de fête sans fromage!	4	3.8	Es macht Spass, Kaese in Gesellschaft zu essen!
B7 Avec tous les accompagnements souhaités	1	2.2	Mit selbst ausgewaehnten Extras, ganz ohne Einschraenkung
<b>SILO C: Emotional Benefits of Cheese</b>			
C2 Y penser, c'est le désirer le manger, ce n'est ne plus s'arrêter!	3	1.8	Schon beim Gedanken muss man ihn haben, und wenn man ihn hat, kann man nicht mehr aufhoeren!
C6 Une fête pour vos sens...voir, sentir, goûter!	4	2.0	Sinnesfreuden pur: Sehen, Riechen, Schmecken!
C5 Echappez à la routine avec du fromage... une manière de célébrer les moments uniques!	5	2.2	Fuer besondere Gelegenheiten!
C8 Pur Plaisir!	1	1.9	Pure Begeisterung!
C7 Une expérience unique.. a partager en famille ou entre amis!	2	2.0	Eine aussergewoehnliche Erfahrung, am schoensten mit lieben Menschen!
C9 Le fromage satisfait vos petites faims!	7	1.9	Macht einfach satt und befriedugt das Verlangen!
C1 Rapide et sympa... manger seul devient un plaisir	-2	2.2	Macht einfach Spass, auch alleine!
C3 Pour vos petit creux, au moment où il faut	1	1.9	Hilft gegen den aufkommenden Hunger!
C4 Vous redonne le sourire...!!	2	1.8	Heitert auf und tut gut!
<b>SILO D: Country of Export for Cheese, and emotional assurance</b>			
D8 Por moi, simplement le meilleur fromage!	0	1.9	Einfach der beste Kaese fuer mich!
D9 Avec les meilleurs standards de qualité auxquels vous faites confiance!	1	2.0	Ein absolut sicheres Produkt, vertrauenswuerdig und mit hoher Qualitaet!
D1 De France	4	1.9	Aus Frankreich
D2 De Suisse	-7	1.9	Aus der Schweiz
D3 D'Italie	-3	1.9	Aus Italien
D4 De Hollande	-14	2.0	Aus Holland
D5 De Grèce	-10	1.7	Aus Griechenland
<b>Elements 'unique' to a country</b>			
A8 Du chèvre avec son goût typique	<b>12</b>	3.4	Schweizerkaese mit kraeftigem Geschmack
D6 De Corse	-5	2.3	Aus Daenemark
D7 Des Pyrénées	-1	2.3	Aus Deutschland

export for cheese. Elements from the three countries are based on total panel results, aggregating the corre-  
 reflect the proportion of respondents who would rate a concept as interesting (7-9) if the element were present  
 with a silo by the utility values for the United Kingdom, to show country effects. Standard errors appear to the  
 of the table. MN = average utility for all respondents from that country; SE = standard error of the mean).

MN 19	SE	United Kingdom Constant	MN 31	SE
8	3	Chunks of matured cheese	12	3.6
7	3.7	Soft, light cream coloured Brie, perfect with crusty bread	12	4.1
5	2.9	Creamy soft cheese	6	3.6
-5	4	Blue cheese with typical and intense flavour	1	3.6
17	3.2	Cubes of Feta cheese for a greek salad or with vegetables	-1	3.8
-3	3.0	Spreadable cheese	-5	4.1
2	3.6	Sliced cheese	-6	4.2
11	2.4	With a glass of wine, or a soft drink of your choice	10	2.7
5	1.9	So tasty you have to lick your lips twice after each bite	5	2.8
3	2.0	You can just savour it, when you think about it	4	2.3
8	2.0	100% natural, fresh and carefully prepared	4	2.6
1	2.0	You can imagine the taste as you see it in front of you	3	2.6
1	2.4	Premium quality...that great traditional taste	1	3.5
12	2.4	With bread and pickle	0	3.0
2	4.0	Cheese is great for parties	-2	5.4
1	4.0	With all the accompaniments you want	-3	3.6
3	2.0	When you think about it, you have to have it... and once you have it you want more	7	2.2
4	2.1	A joy for your senses...seeing, smelling, tasting	5	2.4
2	2.3	Celebrate special occasions with cheese 4 - escape from the routine	2.6	
5	2.4	Pure enjoyment	4	2.4
0	2.3	A real experience...shared with friends or family	3	2.5
-1	2.2	It satisfies your hunger	3	2.4
3	2.5	Quick and fun ... eating alone doesn't have to be boring	1	2.8
-2	2.8	It fills you up – just when you need it	0	2.9
-2	2.3	Cheers you up	-2	2.2
1	2.2	Simply the best cheese for me	3	2.9
2	2.0	With highest quality and standards that you trust	-1	2.2
6	2.2	From France	1	2.4
2	2.3	From Switzerland	-3	2.6
4	2.7	From Italy	-3	2.7
4	2.4	From Holland	-7	2.6
3	2.5	From Greece	-7	2.5
11	3.6	Cheddar with a typical strong flavour	20	4.9
-7	2.7	From Spain	-9	2.4
2	2.7	From Britain	2	2.9

the factors that drive the segmentation into three clusters.

Step 4: Extracting the relevant number of segments is both a statistical task and an interpretive art. The objective of clustering to generate segments which ensure a minimum variability within a segment versus maximum variable across segments, as well as an interpretable segmentation with the clusters 'making sense'. In this spirit we extracted the three segments, which was the minimum number of segments which seemed to 'tell a story'.

Step 5: Compute the average utility value for each element by segment, independent of country, using those respondents who are placed into the segment as the source of the utility values.

#### Like-minded segments across countries

Segmentation divides the consumer population into worlds of individuals having different mind-sets. When segmentation is based on the response to type of cheese, use benefits of cheese, emotional benefits, and country of export for cheese, we work with a different type of segmentation than the conventional segmentation by attitudes so frequently developed (WELLS, 1975). Segmentation based on the utility patterns lies between actual behaviour on the one hand, and general attitudes towards the product on the other hand. We deal here with segmentation emerging from responses to actual stimuli, in the form of small 'advertisements' about the product, rather than in self-stated values and rather than products themselves. Table 5 shows the strongest elements for each of the three mind-set segments that emerged from analyzing what phrases most strongly 'drive' consumer responses.

Where are the three segments found?

When respondents are segmented by the pattern of their responses to test stimuli, a behavioral response rather than attitudinal response, there are no clear correlates in the self-profiling classification which predict segment membership. Therefore, although the segments appear to be homogeneous with respect to the way they respond to messaging, they are not homogeneous with respect to other, easy-to-measure factors, such as age, gender, country, and so forth. This failure to find external correlates to issues about food and nutrition is pervasive (WARDLE *et al.*, 2004). We see an example of such heterogeneity of the segments when we classify the individuals by the country in which they reside (Table 6). Each country has respondents from each segment, albeit in different proportions.

#### Discovering new members in a segment by intervention methods – 'the typing tool'

If membership in a concept-response segment cannot be easily predicted by the conventional methods of data-mining using variables such as age, gender, and even perhaps products bought recently, how then can the segmentation be made more 'actionable', for developers and marketers? The data strongly suggest three different groups of consumers, with different mind-sets, and thus product desires. The segmentation can guide new product development, but only when the individuals in the segments can be properly identified, and a line of communication opened up with them. Once the discovery is made that a specific individual belongs to a segment, the next steps in development and communication are simplified. The segments are homogeneous with respect to mind-sets, and thus look at the world

Table 3 - The eleven dimensions or factors underlying the common elements. The individual elements most highly correlated with each of the 11 dimensions are shown.

Dimension	Element(s) that correlate highest with the dimension	% Variance
Dim1 Dim1	It fills you up - just when you need it Celebrate special occasions with cheese - escape from the routine	13.6
Dim2	Chunks of matured cheese	7.9
Dim3 Dim3 Dim3 Dim3	From Italy From France From Holland From Greece	6.9
Dim4 Dim4	You can imagine the taste as you see it in front of you So tasty you have to lick your lips twice after each bite	5.4
Dim5 Dim5	Sliced cheese Spreadable cheese	4.6
Dim6	With bread and pickle	4.1
Dim7	Cubes of Feta cheese for a Greek salad or with vegetables	3.9
Dim8	100% natural, fresh and carefully prepared	3.5
Dim9	A joy for your senses...seeing, smelling, tasting	3.5
Dim10 Dim10	Quick and fun ... eating alone doesn't have to be boring Pure enjoyment	3.2
Dim11 Dim11	Soft, light cream coloured Brie, perfect with crusty bread Creamy soft cheese	2.9

Table 4 - Results of k-means splitting cases into 3 groups.

FACTOR used in clustering	Sum of Squares between factors	Degrees of freedom	Sum of squares within factors	Degrees of freedom	F-ratio
FACTOR(1)	66.41	2	260.58	325	41.42
FACTOR(2)	38.17	2	288.82	325	21.48
FACTOR(3)	1.01	2	325.98	325	0.50
FACTOR(4)	14.65	2	312.34	325	7.63
FACTOR(5)	51.84	2	275.15	325	30.63
FACTOR(6)	20.72	2	306.27	325	11.00
FACTOR(7)	59.13	2	267.86	325	35.87
FACTOR(8)	5.15	2	321.84	325	2.60
FACTOR(9)	28.40	2	298.59	325	15.46
FACTOR(10)	30.72	2	296.27	325	16.21
FACTOR(11)	76.96	2	250.03	325	50.03
Total	393.21	22	3203.78	3575	

of cheese similarly, at least within the limits of this study.

Although conventional geo-demographics and even behaviors do not predict one's 'mind-set' for specific messaging, for any particular food, at the granular level, it is quite possible to create a simple 'intervention', a small and easily-administered survey', that can identify a person as belonging to a segment. The notion here is that instead of predicting

segment membership of the individual without knowing the person, there is interaction with the person using a short interview. This way of thinking mirrors today's medical practice, where in order to understand the patient the doctor takes a blood sample, and from the pattern of the scores from various tests performed on the patient's blood, understands what problems and even illnesses the patient might have.

Table 5 - The strongest performing elements for the total panel and for each of the three concept-response (mind-set) segments. The table shows the coefficients for the interest model, for total panel, and for each of the three mind-set segments. The segmentation transcends the three countries. Only common elements across countries were used to develop the segments.

	Total 33	Seg1 34	Seg2 28	Seg3 39
<b>Winning elements - total panel</b>				
Soft, light cream coloured Brie, perfect with crusty bread	14	0	26	26
Chunks of matured cheese	9	9	13	3
With a glass of wine, or a soft drink of your choice	8	3	9	17
<b>Winning elements - Segment 1 of 3 – Cheese with something</b>				
Cubes of Feta cheese for a Greek salad or with vegetables	2	10	3	-14
Chunks of matured cheese	9	9	13	3
When you think about it, you have to have it...and once you have it you want more	4	8	0	0
Pure enjoyment	3	8	-6	5
With bread and pickle	5	7	5	0
It satisfies your hunger	3	7	-4	7
A joy for your senses...seeing, smelling, tasting	4	7	-1	5
<b>Winning elements - Segment 2 of 3 – Cheese is the focus</b>				
Soft, light cream coloured Brie, perfect with crusty bread	14	0	26	26
Chunks of matured cheese	9	9	13	3
Creamy soft cheese	4	-5	12	8
100% natural, fresh and carefully prepared	6	3	11	4
So tasty you have to lick your lips twice after each bite	4	2	10	-2
With a glass of wine, or a soft drink of your choice	8	3	9	17
Blue cheese with typical and intense flavour	3	0	9	1
<b>Winning elements - Segment 3 of 3 – The cheese experience</b>				
Soft, light cream coloured Brie, perfect with crusty bread	14	0	26	26
With a glass of wine, or a soft drink of your choice	8	3	9	17
Celebrate special occasions with cheese - escape from the routine	4	3	0	11
From Switzerland	2	-1	-1	11
A real experience...shared with friends or family	2	2	-5	11
Cheese is great for parties	2	3	-4	9
Creamy soft cheese	4	-5	12	8
It satisfies your hunger	3	7	-4	7

Discriminant function analysis (SYSTAT, 2002) uncovers the elements for a typing test. The test itself comprises a few elements, presented as direct phrases. Since the persuasion model shows how each individual element 'drives' the 9-point rating scale, one can create 33 different stand alone phrases, from the 33 common elements across the three countries. For each respondent, we know both how each of the phrases would score on the 9-point rating scale if presented as a stand-alone concept, and the segment to which the respondent belongs. Discriminant function analysis identifies a limited set of such phrases, i.e., one-element concepts which together maximize the likelihood of assigning a person to the correct segment. Discriminant function analysis provides the clas-

sification rule, which can be used to assign a new individual to one of the three segments (i.e., scoring a new person).

A worked example of the classification rule appears in Table 7. Not all elements need be used. In fact, only responses to three elements are needed (A1, A9, C2) to generate almost 2/3 correct assignment. These elements generate the highest F ratios for ability to classify respondents correctly. The table shows the parameters of the three classification functions, hypothetical ratings by four new respondents (Res1-4), the value of the classification function corresponding to each segment for each respondent (bottom of the table), and then the assignment of the respondent to the segment whose classification function shows the highest numerical value.

Table 6 - The heterogeneous nature of each segment, when it comes to country in which the respondents reside. Each segment has consumers from all countries. Each country has consumers from all segments. Thus, the segmentation transcends country.

How segments distribute by segment and country	Seg1 Cheese with something	Seg2 Cheese as the focus	Seg3 The cheese experience	Total%	Total No.
France	56	45	42		143
Germany	57	29	17		103
United Kingdom	38	31	13		82
<b>Total</b>	<b>151</b>	<b>105</b>	<b>72</b>		<b>328</b>
<b>Distribution of the three segments within each country (look across columns for each row)</b>					
France	39%	31%	29%	100%	143
Germany	55%	28%	17%	100%	103
United Kingdom	46%	38%	16%	100%	82
<b>Total</b>	<b>46%</b>	<b>32%</b>	<b>22%</b>	<b>100%</b>	
<b>Distribution of the three countries within each segment (look down across rows for each column)</b>					
France	37%	43%	58%	44%	143
Germany	38%	28%	24%	31%	103
United Kingdom	25%	30%	18%	25%	82
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	

Sometimes it is difficult to assign a person to only one segment, because the classification functions are very close. In that case, two segments are shown. The assignment is shown by the shaded cell. For example, Respondent 1 is assigned to Segment 2. In contrast, Respondent 4 assigns ratings to the three elements such that it is probably difficult to assign the respondent to a segment since the classification functions are negative. When, however, the respondent must be assigned, both Segment 1 and Segment 2 show approximately equal functional values for the classification function and so the respondent would be assigned to both Segment 1 and to Segment 2.

Finally, discriminant function analysis does not perfectly classify all of the respondents. It does the best possible, given noise in the responses. Table 8 shows the performance of the typing tool for the data taken from the 328 respondents. The

typing tool was created using the 'jack-knife' procedure, which estimated the parameters of the model, but left out certain cases in order to use them for validation testing. The classification function generates about 2/3 correct assignment, double what might be the case for random allocation of respondents to segments.

## DISCUSSION

To increase the odds of an item being purchased, the marketer must shape the product messaging. The marketer needs insights as to what to say, what not to say, how to say it and to whom it should be said. We identified winning elements of the messaging and examined them across countries. We found that there are three mindsets of consumers. It is important to note that these mindsets pertain to one product, cheese, and

Table 7 - Classification functions to assign new respondents to a segment, and example of the function applied to four respondents (Res1 - Res4).

		Seg1	Seg2	Seg3	Res1	Res2	Res3	Res4
A1	Constant	-4.13	-4.72	-5.37				
F=25.83	Sliced cheese	0.30	0.42	-0.23	7	5	1	2
A9	SOFT, light cream coloured Brie, perfect with crusty bread	0.31	0.85	0.77	5	5	8	2
F=38.39								
C2	When you think about it, you have to have it...and once you have it you want more	0.73	0.07	0.76	1	8	4	2
F=30.75								
<b>Results: Assignment of new respondents to one of the three segments</b>								
				Seg1	0.26	<b>4.78</b>	1.58	<b>-1.44</b>
				Seg2	<b>3.09</b>	2.77	<b>3.36</b>	-1.49
				Seg3	-2.36	3.47	<b>3.66</b>	-2.75

Table 8 - Assignment successes and failures by the discriminant function, working on the 238 respondents. The correct assignments in the training session are shown in the shaded cells.

	And classified as Seg1	And classified as Seg2	And classified as Seg3	% correct
Respondent is really in Seg1	<b>119</b>	23	9	79
Respondent is really in Seg2	41	<b>53</b>	11	50
Respondent is really in Seg3	21	18	<b>33</b>	46
Total	181	94	53	<b>63</b>

that they reveal differences at the very granular level of communication. Further, the approach represents a departure from the traditional macro-segmentation, done for food in general, where the difficulty then becomes one of determining how to apply the segmentation to the particular food (e.g., WELLS, 1975). Our approach begins from the ground up, and at all times maintains granularity of information, insight, and direction.

For each of these identified mindsets, the marketer may use the winning elements to shape an effective message that will enhance the acceptance of cheese. Each of the three major mindset segments for cheese responds to a different set of messages. The cross-national segmentation suggests a common type of message for the segment, independent of country. That is the first step. The second step is to fine tune the message for the segment, taking into account the sensibilities of the country, but remaining faithful to the general segmentation which exists. This strategy provides guidance both for marketing, but also for future product development, where the thrust can be on the basis of segments that exist across countries.

Making segmentation actionable – finding these respondents for sales and product development

The segmentation of respondents by patterns of utilities creates groups that

are intuitively meaningful. However, there are no clear methods by which to link membership in a segment to some demographic, attitudinal, or even need-state variable. Certainly there are differences between the segments. If one somehow ‘knew’ an individual’s likelihood of being a member of Segment 1 or 2, or 3 one could craft a strongly appealing sales message using these data along with other messaging relevant for the consumers in the particular segment. However, knowing the country, gender, age, income, etc. does not predict segment membership. Additional analyses of the segments by gender and age (not shown) did not reveal any strong predictors of segment membership.

Opportunities for improved product development and marketing

The lack of clear predictors of membership in segments coupled with the evidence that these segments appear to have strongly held preferences suggests that other methods must be developed to classify an individual as belonging to a concept-response segment. These other methods will not necessarily be simply statistical analyses of databases, but rather experimental interventions with prospects, as shown here with the three-question typing tool. The intervention or personalized typing should present the prospect with a stimulus or set of stimuli, get the response of the prospect, and then assign the pros-

pect to a segment based on the pattern of responses.

Instead of the segmentation being problematic because it does not directly co-vary with country, or any other conventional geo-demographic, or even other behaviors, the segmentation may provide new opportunities for targeted product development and marketing. Conventional thinking looks for external factors to predict segment membership. Once these factors are shown not to work, it becomes clear that a different way is required when looking at segments. That different way uses an active intervention with the respondent as the way to establish segment membership for a particular individual. Furthermore, the intervention is quite easy; a three-question interview followed by a classification function.

From this simple approach follows three immediate opportunities for the food industry:

Opportunity 1 – ‘sequence the genome of the consumer mind’

This study shows how to understand the consumer mind with respect to one product, cheese, across different countries. If instead of one product being tested, one could do this same cross-national segmentation with 20+ products. For each product in turn, in a study run with the appropriate respondents, one would segment the respondents for that product, and then develop a product-specific typing test. At the end of the process, the result would be 20+ short, easy to administer questionnaires, or typing tests, each test each comprising 3-6 questions. Each typing questionnaire would correspond to a specific product. The nature of the segmentation need not be the same for each product.

At this point the typing tool becomes a way to understand entire populations, and effects of acculturation, and so forth. Any new respondent would then ‘type’ himself on each of the products,

with the short, product-specific typing questionnaire. The result would be equivalent to sequencing a genome, only this time it would be sequencing the genome of the mind with respect to the different foods. Further understanding of consumer responses to food and beverage would emerge from understanding the mind-set of many individuals to a large array of different foods.

Opportunity 2 – ‘targeted development’ to individuals with the same mind-set

Current practice in product development uses consumers who identify themselves either as users, or non-users, or lapsed users. The underlying thinking is that these different groups of individuals have different needs to be satisfied. With the typing tool, one can quickly identify an individual as belonging to a mind-set segment, and work with groups of people with like mind-sets. The product development task then speeds up because of the coherence of the mind-set. Development efforts would work with individuals of similar mind-sets, rather than of known user groups or demographic groups. Such individuals would be easy to identify by the short typing questionnaire, which in turn could be embedded in a ‘mind-typing’ website. Such development efforts would be more focused, and presumably far more productive, because the individuals for whom the product is being developed are more likely to have homogeneous preferences with respect to the specific products.

Opportunity 3 – ‘targeted sales communication’

Current advertising is purchased on the basis of media habits (magazines read, television viewing patterns, etc.). With the advent of the new media, and with an understanding of the mind-set of any particular individual available through a rapid typing exercise, one can create targeted, individualized messaging for cheese, or any other

er product, appropriate for an individual's known mind-set. The intervention exercise identifies the mind-set as well as referring back to the database, which shows what messaging is appropriate for that mind-set.

## CONCLUSIONS

Segments that emerge here come from actual responses to concepts, rather than from more easily measured, but perhaps less clearly related variables such as those that might be purchased from a third-party database. In dozens of studies of this type, whether with products or service variables or even social attitudes, there do not seem to be clear, a priori predictors of membership in a concept-response segment that might be gleaned from standard socio-demographic information. Yet the segmentation makes intuitive sense. The data are too compelling, since the segmentation is based upon the very response to concepts about the specific product, namely cheese. First, the immediacy of the segmentation, its clarity, and its compelling nature suggest that the segments are real. Second, the segmentation is based on response patterns to actual communication phrases of the type a person would see in advertisements. Third, when we do these types of studies with many products, we find similar concept-response segments emerging again and again (MOSKOWITZ *et al.*, 2005). We conclude that we are dealing with a real division of people in the population which allows us to shape the message content. However, we still do not have the necessary rules by which to predict membership in that division, except by behavioral responses, i.e., reactions to the stimulus itself.

Identifying a person as belonging to a mind-set or concept-response segment comes from a short intervention interview, the typing test, rather than coming from data-mining. The ongoing assump-

tion is that the assignment of new individuals to segments is going to be far more accurate than a statistical, data-mining approach which looks for easy-to-purchase exogenous variables that are then combined to create a predictive model. With the stronger segmentation due to mind-set segmentation, it may be possible to speed up and more precisely focus the process of developing products, selling products, and in turn understanding consumers at a profound level.

## REFERENCES

- Aarts P., Paulus K., Beckley J. and Moskowitz H.R. 2002. Food craveability and business implications: The 2002 EuroCrave database. Presented at the ESOMAR Congress, Barcelona, Spain.
- Arnade C., Munisamy G. and Pick D. 2009. Consumers Show Strong Brand Loyalty in Cheese Purchases. Rept. Amber Waves, June. Available online from <http://www.ers.usda.gov/AmberWaves/June09/Findings/CheesePurchases.htm>
- Ashman H. and Beckley J.H. 2004. Experiencing: *Kool-Aid Ice Cool...* with emphasis on cool. *Food Processing* July, 65 (7): 22.
- Beckley J. and Moskowitz H. R. 2002. Databasing the consumer mind: The Crave it!, Drink It!, Buy It! & Healthy You! Databases. Institute of Food Technologists Vol. 74, Anaheim, CA.
- Bonnetti E. 2004. The effectiveness of meta-brands in the typical product industry: mozzarella cheese. *Brit. Food.*, 106: 746.
- Bogue J. and Ritson C. 2005. Integrating consumer information with the new product development process: the development of lighter dairy products. *Int. J. Consumer Studies* 30: 44.
- Box G.E.P., Hunter J. and Hunter S. 1978. "Statistics For Experimenters," John Wiley and Sons, New York.
- Ekman G., and Akesson C. 1964. Saltiness, sweetness and preference: A study of quantitative relations in individual subjects. Rept. 177. Psychological Laboratories, University of Stockholm, Stockholm, Sweden.
- Foley M., Beckley J., Ashman H. and Moskowitz H.R. 2009. The mind-set of teens towards food communications revealed by conjoint measurement and multi-food databases. *Appetite*. [Accessed online 01-06-09 from doi:10.1016/j.appet.2009.01.006].
- Gil J. and Sanchez M. 1997. Consumer preferences for wine attributes: A conjoint approach. *British Food J.* 99: 3.
- Green P.E. and Krieger A.M. 1991. Segmenting

- markets with conjoint analysis. *J. Marketing* 55(S), 20.
- Green P.E. and Krieger A.M. 1996. Individualized hybrid models for conjoint analysis. *Management Sci.* 42(6): 850.
- Green P.E. and Srinivasan V. 1980. A general approach to product design optimization via conjoint measurement. *J. Marketing* 17: 45.
- Kapsdorferove Z. and Nagyova L. 2007. Consumer behavior at the Slovak dairy market. *Agricultural Economics*.
- Kotler P. 1997. "Marketing Management: Analysis, Planning, Implementation, and Control". Prentice Hall, New Jersey.
- Liggett R.E., Drake M.A. and Delwiche J.F. 2005. Determining what consumers desire in Swiss cheese using partial-least squares regression of descriptives and consumer data. Presented at Annual Meeting, Institute of Food Technologists, New Orleans, LA, July 15-20.
- Luce R.D. and Tukey J.W. 1964. Conjoint analysis: A new form of fundamental measurement. *J. Math Psych.* 1:1.
- Luomala H.T. 2007. Exploring the role of food origin as a source of meanings for consumers and as a determinant of consumers' actual food choices. *J. Business Res.* 60(2): 122.
- Mac Elroy B. 2000. Variables influencing dropout rates in Web-based surveys. *Quirk's Marketing Research Review*, July/Aug.
- Moskowitz H. 2003. From psychophysics to the world...data acquired, lessons learned. *Food Quality Pref.* 15(7-8): 633.
- Moskowitz H.R., Beckley J.H., Ashman H., Luckow T., Paulus K. and Aarts P. 2008. You're IT! Cross-National Segments for a Food Product: Defining Them and a Strategy for Finding Them in the Absence of "Mineable" Databases. *J. Database Marketing* 15(3): 191.
- Moskowitz H.R., German J.B. and Saguy I.S. 2005a. Unveiling health attitudes and creating good for you foods: The genomics metaphor, consumer innovative web-based technologies. *Crit. Rev. Food Sci. Nutr.* 45:165.
- Moskowitz H.R. and Gofman A. 2004. System and method for performing conjoint analysis. Provisional patent application, 60/538,787, filed January 23.
- Moskowitz H. and Gofman A. 2007. "Selling Blue Elephants: How to Make Great Products Before Your Customers Even Know They Want Them", Wharton School Publishing, Upper Saddle River, New Jersey.
- Moskowitz H.R., Gofman A., Ittay B., Katz R., Manchaiah M. and Ma Z. 2001. Rapid, inexpensive, actionable concept generation and optimization – the use and Promise of self-authoring conjoint analysis for the foodservice industry. *Food Service Technol.* 1: 149.
- Moskowitz H., Itty B., Fink C. and Ewald J. 2003. Deconstructing automobile messaging: Clues to brand strategy. *J. Database Marketing* 10: 200.
- Moskowitz H.R., Itty B., Shand A. and Krieger B. 2002. Understanding the consumer mind through a concept category appraisal: Toothpaste. *Canadian J. Market Res.* 20: 3.
- Moskowitz H. R., Jacobs B.E. and Lazar N. 1985. Product response segmentation and the analysis of individual differences in liking. *J. Food Quality*, 8: 168.
- Moskowitz H.R., Porretta S. and Silcher M. 2005b. "Concept Research in Food Product Design and Development", Blackwell Professional, Ames, Iowa.
- Moskowitz H., Silcher M., Beckley J., Minkus-Mckenna D. and Mascuch T. 2005c. Sensory benefits, emotions and usage patterns for olives: using Internet-based conjoint analysis and segmentation to understand patterns of response. *Food Quality Pref.* 16(4): 369.
- Murphy M., Cowan C. Meehan H. and O'Reilly S. 2004. A conjoint analysis of Irish consumer preferences for farmhouse cheese. *British Food J.* 106(4): 288.
- Niedrich R.W. and Swain S.D. 2008. The effects of exposure-order and market entry-information on brand preference: a dual process model. *J. Acad. Mark. Sci.*, 36: 3.
- Pangborn R.M. 1970. Individual variations in affective responses to taste stimuli. *Psychonomic Sci.* 21: 125.
- Pattison N. and Lindgreen, A. 2004. Successes and failures in the dairy industry: South west England and northwest France. *Brit. Food J.* 106(6): 422.
- Schultz D.E., Tannenbaum S.I. and Lauterborn R.F. 1993. "Integrated Marketing Communications, Pulling it Together and Making it Work", NTC Publications, Chicago, Illinois.
- Steenkamp J. and Hofstede F.T. 2002. International marketing segmentation issues and perspectives. *International J. Res. Marketing* 19: 185.
- Systat. 2004. "SYSTAT for Windows User Manual", Version 11. SYSTAT Software Inc., Chicago, Illinois.
- Trevisiol A. 2005. The European Dairy Industry Model: Consumption of Dairy Products in the EU-15. 1960-2000 and 2010 Forecasts, 1: 23.
- Wardle J., Haase A.M., Steptoe A., Nillapun M., Jonwutiwes K. and Bellisle F. 2004. Gender differences in food choice: the contribution of health beliefs and dieting. *Annual Behavior of Medicine* 27(2): 107.
- Wells W.D. 1975. Psychographics: A critical review. *J. Marketing Res.* 12: 196.
- Westad F., Hersleth M. and Lea P. 2005. Strategies for consumer segmentation with applications on preference data. *Food Quality Preference* 15(7-8): 681.
- Wittink D.R., Vriens M. and Burhenne W. 1994. Commercial use of conjoint analysis in Europe: Results and critical reflections. *Int. J. Res. Mark.* 11(8): 41.

Revised paper received June 4, 2009 Accepted June 30, 2009